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# Individual Sailor Assignment Model (ISAM)

***75th MORSS  
WG 20  
12 June 2007***



# Background



- Typical Sailors alternate between 4-5 years on sea duty and 2-3 years on shore duty
  - Sea duty – make routine 6-8 month deployments assigned to ships, submarines and aviation squadrons
  - Shore duty – “9 to 5” with relatively little weekend work
- Navy is considering alternatives to traditional deployment plans and sea-shore rotation policy to provide a surge capacity with greater flexibility and constant readiness
  - Fleet Response Plan (FRP)
  - Flexible Deployment Concept (FDC)
- Tasker from Chief of Naval Personnel: assess the impact of alternative sea/shore rotation schemes on a sailors professional development, career progression and quality of life
  - Issue: what can an individual sailor expect over an extended period of sea/shore rotation or extended sea duty?
    - How much time at sea and away from family?
    - How much time off?
    - Impact on career development and advancement?



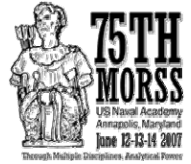
# Scope



- **Model impact of alternative sea/shore rotation schemes on individual sailors**
- **“Standard”, “Extended” and “Alternative” rotation schemes**
  - **Standard: 4-6 years at sea followed by 2-3 on shore**
  - **Extended: 5-10 years at sea followed by 3 years on shore**
  - **Alternative schemes:**
    - **Pooling – Sailors on sea duty rotate into a “respite” pool (e.g. 4 months out every 18) – applied at squadron or wing level**
    - **Multi-crewing – Blue/Gold, 4/3 (4 crews for 3 ships)**
    - **Others**
- **Alternatives to be compared on the basis of metrics**
  - **OPTEMPO**
  - **QOL**
  - **Career progression**



# Methodology



## *Modeling approach ...*

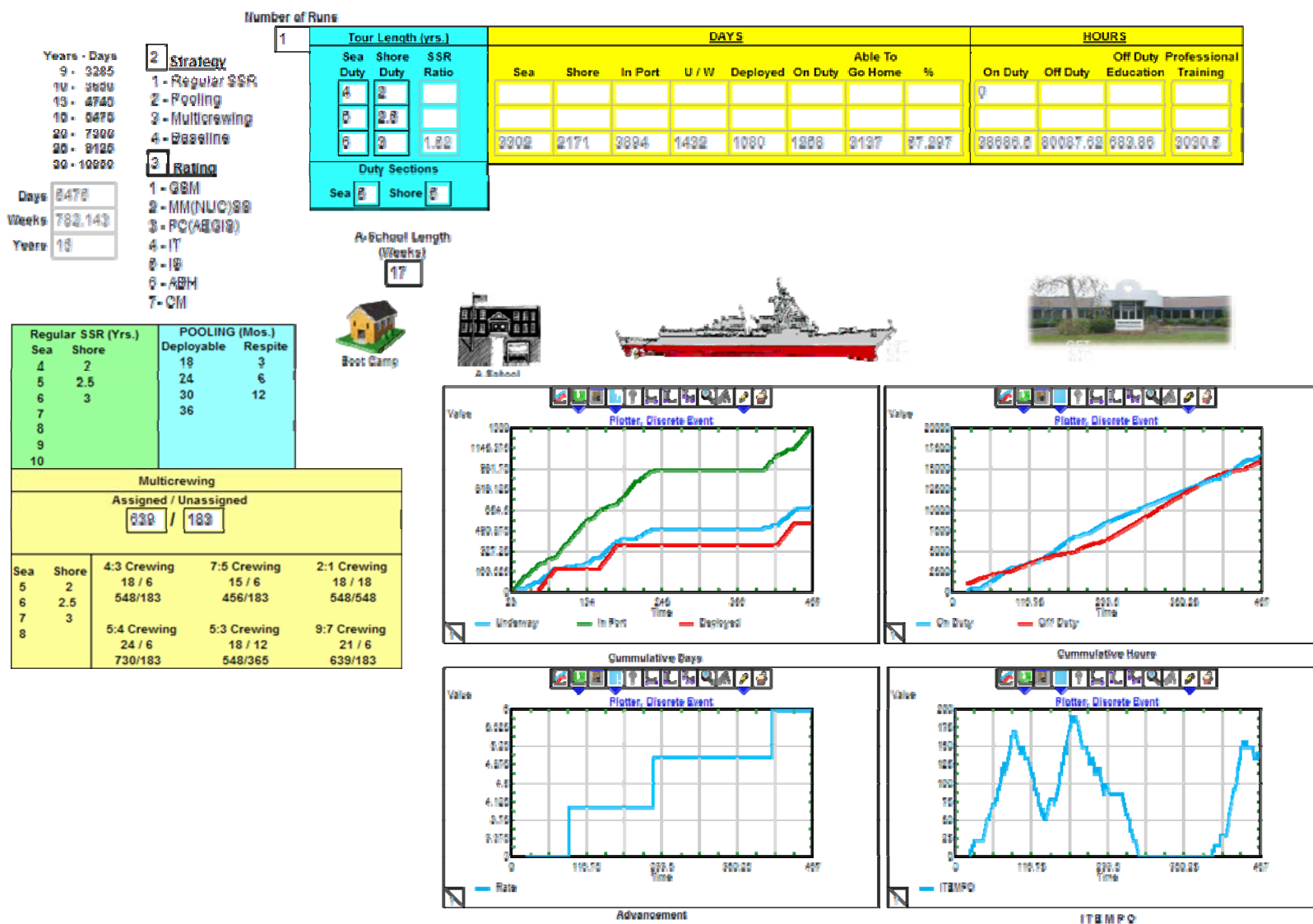
- Initially model ship/sailor activity over a 9-year period
- Each week, identify the unique sailor/assignment “state”
  - Example of “states”:
    - Ship underway with sailor assigned to ship
    - Ship pier side, sailor at a formal school
  - Unique standard “work week” for each “state” which defines hours for work, rest, off duty, etc
- Compare:
  - Relevant metrics based on cumulative time in respective “states”
  - How long it takes to complete career requirements versus how much time is available

## *Discrete Event Simulation” ...*

- Collects data for diverse attributes on individuals as they “flow” through the system
- Individual in the system represents an individual that would follow policy rules as written
  - Takes into account advancement and unit’s operational employment
  - Adaptable to multiple rotation schemes and time intervals
  - Receptive to business rules and policy excursions
  - Allows for “what if” analysis



# ISAM Screen Shot



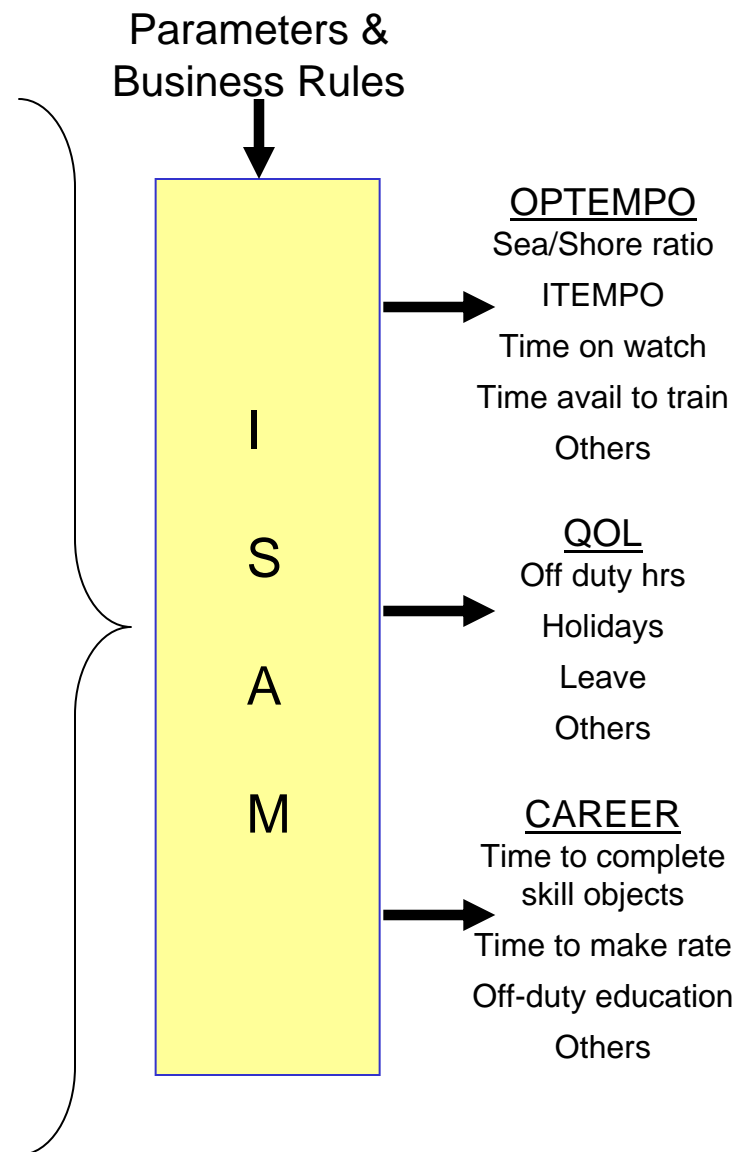


# Model Architecture



## Inputs

- **Ship's weekly schedule & activity**
  - Homeport, underway, SRA, others
  - Upkeep, Exercise, Deployment ...
- **Sailor's assignment & activity**
  - Ship, Shore, Shore Detachment
  - Duty, Leave, School, Transit, others
- **Scheduled training courses**
  - A and C schools, rate specific schools (CANTRAC), shipboard firefighting, etc.
- **Career progression requirements**
  - OJT, distance learning, certifications, exams, others
- **Perquisites for each skill object and estimated completion time**
  - Well defined for some rates, less so for others







# Model Parameters



## SHIP

<u>Status</u>
Pierside
Underway
At Anchor
Drydock
<u>Location</u>
Homeport
Conus Port
Local Oparea
Transit
Deployed
<u>Activity</u>
Arrival/Departure
Trng/Readiness
Maintenance
Operations
Support
Standdown
Holiday
Inspection
Exercise
Sea Trials
Exercise
Sea Trials
Support Ops
Other

From Ship Schedule

## SHORE ACTIVITY

<u>Location</u>
FCA
CONUS Non-FCA
OCONUS
<u>Activity</u>
Ship support
Shore support
Standdown
Holiday
Inspections

## SAILOR

<u>Assignment</u>
Ship
Shore Det
Shore Duty
Training
TPPH
Others
<u>Rate</u>
E1-3
E4
E5
E6
E7

From Sea/Shore  
Rotation Plan

## SKILL OBJECTS

<u>Professional Dev</u>
Courses
Schools
Proficiency
Skill sets
Assessments
<u>Personnel Dev</u>
Courses
Schools
OJT
Leadership
Courses
Schools
Assignments
<u>Cert &amp; Qual</u>
Certificate date
Qual date
Performance
Tests
Evals

From 5VM, ECM,  
Fleet SMEs, other

## WEEKLY HOURS

<u>On Duty</u>
On watch
Training
Service diversions
Maintenance
Other
<u>Off Duty</u>
Sleeping
Messing
Personnel Needs
Free Time
Leave
Holiday

From Standard  
Workweek

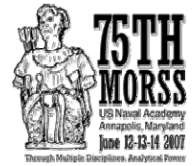


	Pierside or Local Ops					U/W Local Ops					Deployed OCONUS																																																						
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52													
1	PDL+U					SRA																				COM2X																																							
Year	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104													
2						JTFEX		POM		DEPLOYED																														PDL+U																									
Year	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156													
3						SRA															COM2X										JTFEX							POM					DEPLOYED																						
Year	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208													
4	DEPLOYED																				PDL+U										DSRA																																		
Year	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260													
5											COM2X										JTFEX										POM					DEPLOYED																													
Year	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312													
6	DEPLOYED						PDL+U					SRA																									COM2X																												
Year	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364													
7	JTFEX										POM										DEPLOYED																														PDL+U														
Year	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416													
8											SRA																									COM2X										JTFEX							POM												
Year	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468													
9	DEPLOYED																				PDL+U															SRA																													



**ISAM**  
**Example**

## 4-3-4 Rotation versus Over- Manning



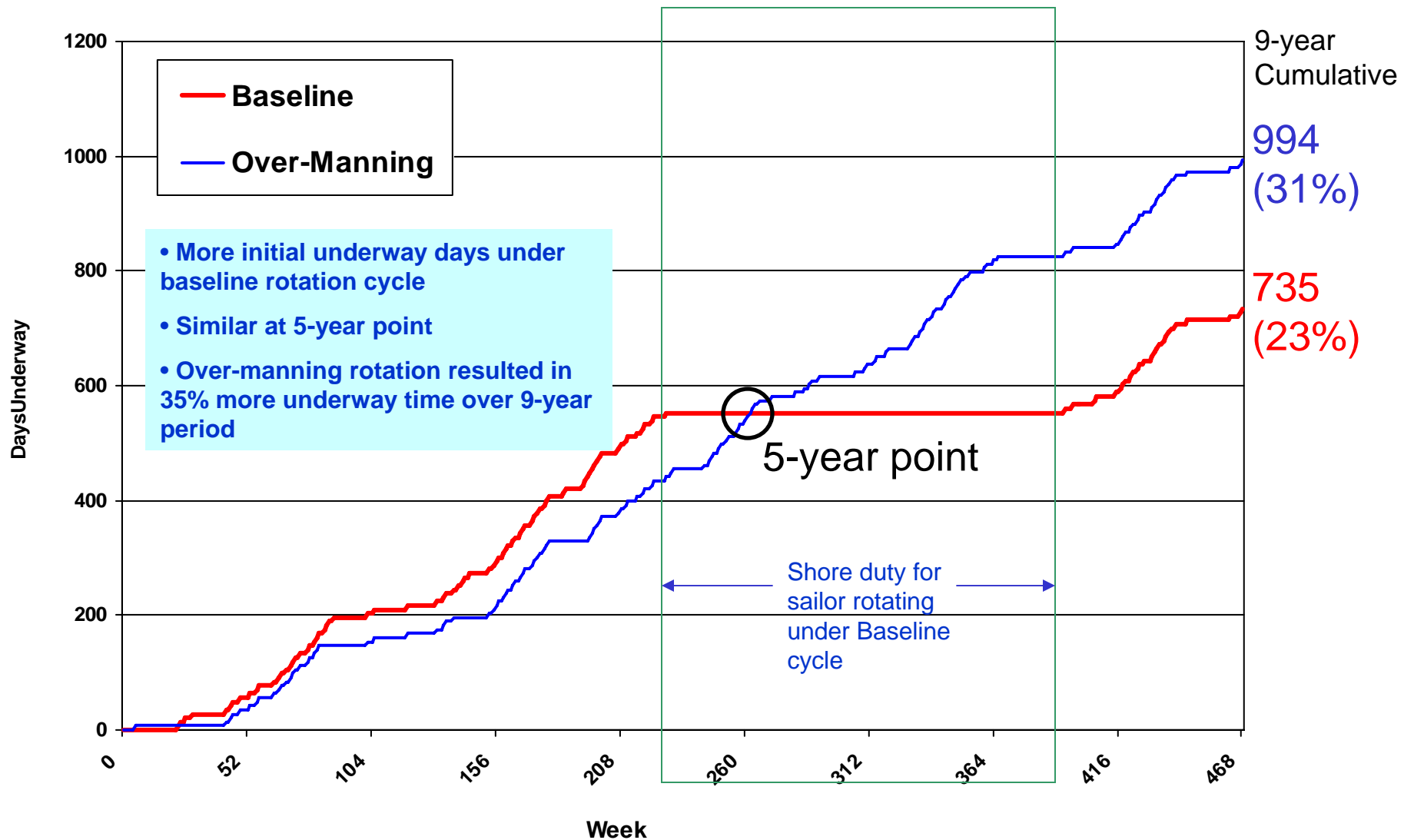
### 4-3-4 (Baseline)

- Sailor checks into ship immediately after completion of A-school (as E3).
- Sailor schedule is tied to ship during 4 year sea duty assignment.
- When assigned to ship, sailors attend formal training (schools) as operational schedule allows. Sailors do not attend formal schools on shore duty.
- Sailor rotates to shore duty after 4 years, then back to ship.
- Shore duty assignment may or may not be in CONUS.

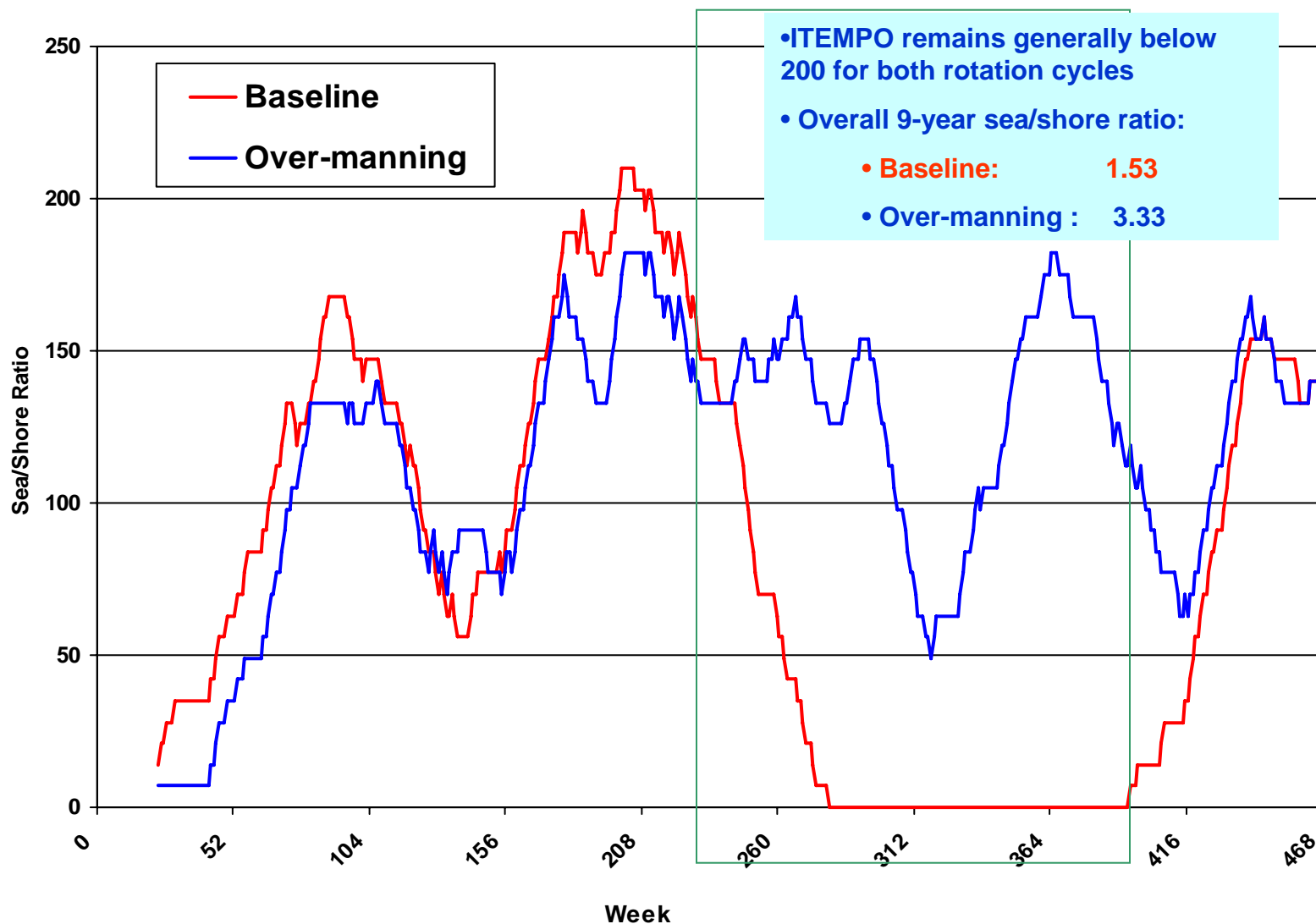
### Over- Manning Concept

- Sailor checks into ship immediately after boot camp.
- Sailor is assigned to the ship for extended period (9 years) but periodically rotates into 30% “shore detachment”.
- Shore detachment supports ship but primarily serves as a “training cycle” for the sailor. Sailors typically attend formal schools when assigned to the shore detachment.
- Sailor does not rotate on to a conventional shore duty but remains attached to the ship or the associated shore detachment.

# Cumulative Underway Days

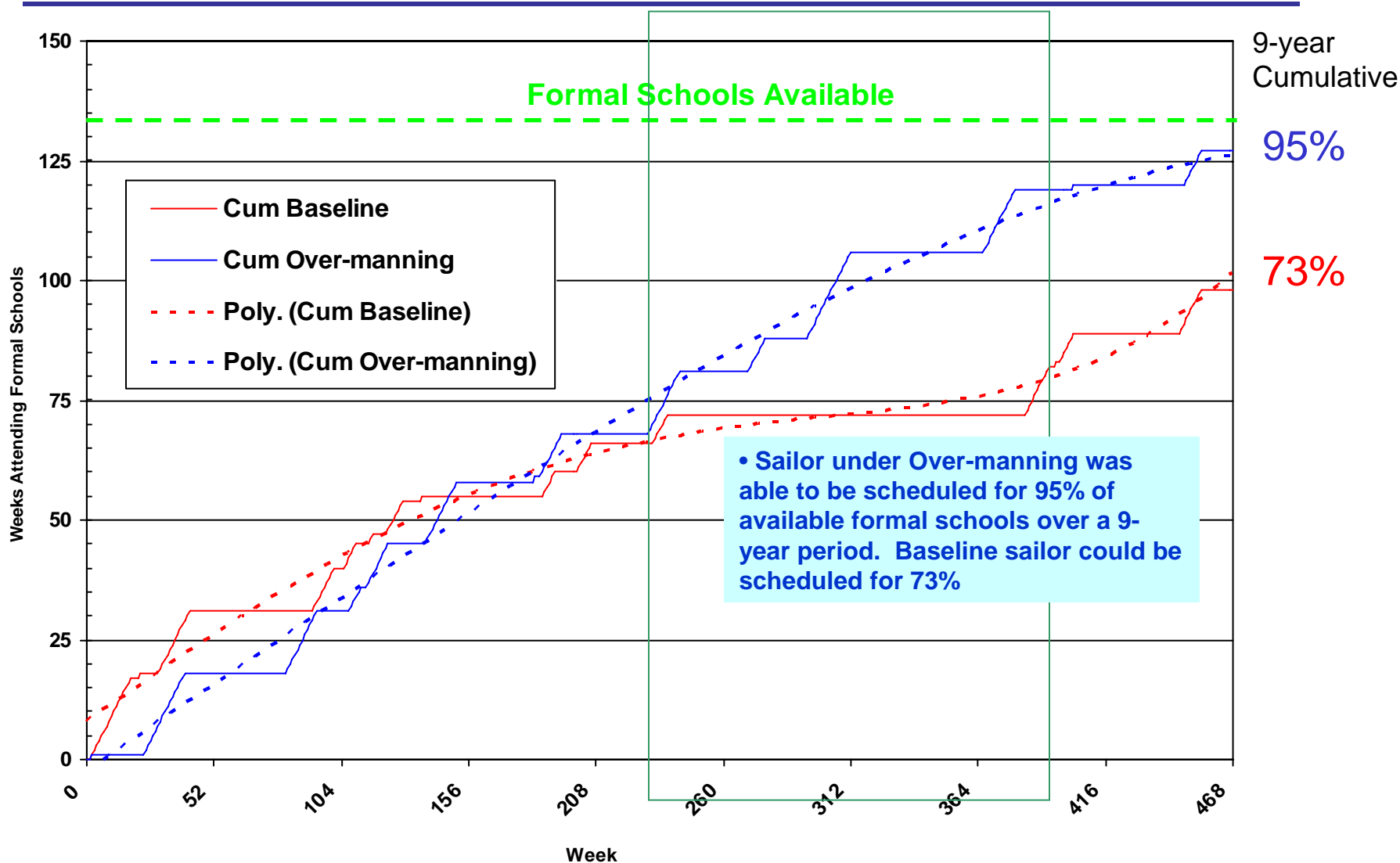


*Results shown are for ET and DDG*

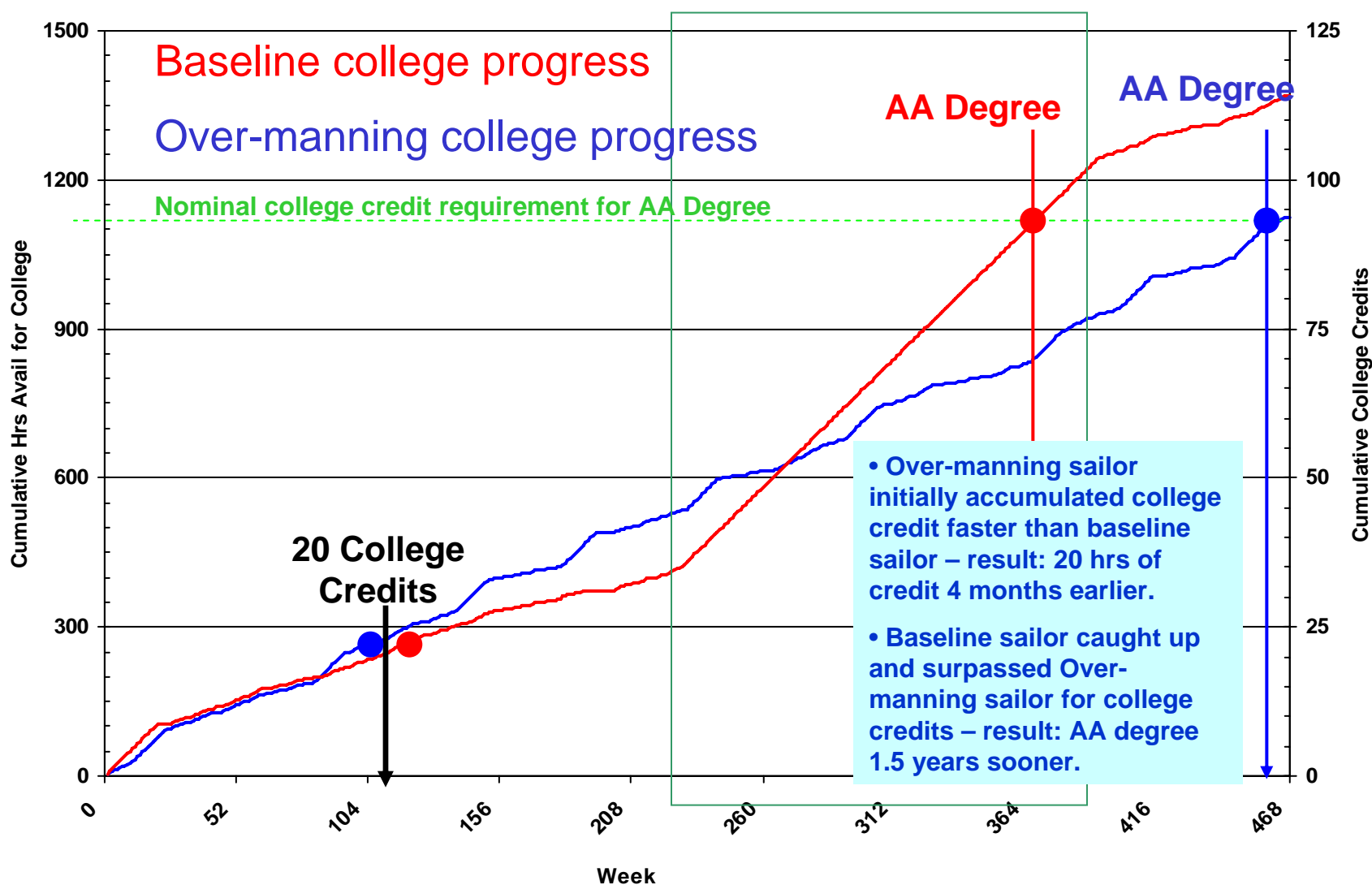


\* ITEMPO defined as # days away from homeport in last 365.

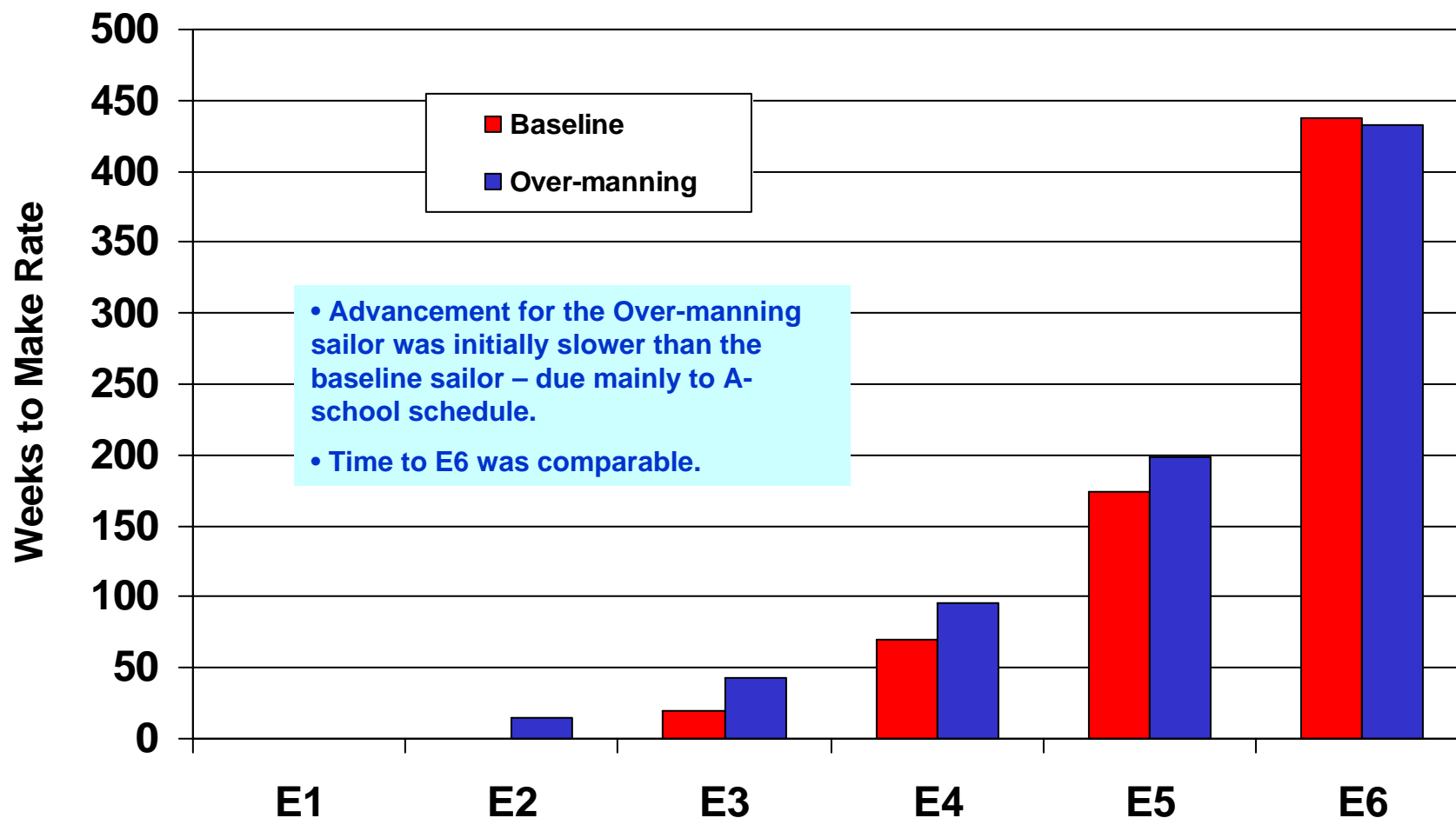
# Formal Schools\*



\* Formal schools could be scheduled during sea detachment periods (Over-manning) or when ship was not underway for Intermediate or Advanced training or deployed. Schools were not scheduled for sailors on shore duty.



# Advancement





# Summary

## *Sailor under Over-manning rotation experienced...*

- 42% more underway days
- 40% less shore duty
- 48% more time away from homeport
- Higher average ITEMPO (but did not exceed 200 days)
- 18% fewer college credits (however did earn a AA degree)
- Overall 12% longer to make rates but made E6 slightly faster
- 30% more training time
- 33% more formal school attendance (95% of all available schools)
- Comparable leave and holidays

## *Bottom Line:*

- When compared to 4-3-4 rotation, Over-manning concept resulted in a sailor that spent more time at sea, attended more formal schools, had less time for off duty college and initially advanced somewhat slower.

	Work Week		Sea/Shore Ratio			Quality of Life						Training & Career Progression					
Metrics	Cum hrs on duty	Avg wkly hrs on duty	Cum days SEA DUTY	Cum days SHORE DUTY	Sea Shore Ratio	Cum underway days	Cum days Out of homeport	Cum off-duty hours	Avg wkly hrs off duty	Holidays off	Leave days taken	Cum Formal Training	Pct schools attended	Cum training hrs avail	College Credits	Weeks w/20 credits	Weeks with AA degree
<b>Baseline</b>	<b>20034</b>	<b>42.8</b>	<b>1981</b>	<b>1295</b>	<b>1.5</b>	<b>735</b>	<b>1302</b>	<b>15446</b>	<b>33.0</b>	<b>72</b>	<b>224</b>	<b>98</b>	<b>72.1%</b>	<b>1903</b>	<b>114</b>	<b>361</b>	<b>109</b>
<b>Over-manning</b>	<b>20136</b>	<b>43.0</b>	<b>2520</b>	<b>756</b>	<b>3.3</b>	<b>1043</b>	<b>1932</b>	<b>13728</b>	<b>29.3</b>	<b>71</b>	<b>245</b>	<b>127</b>	<b>93.4%</b>	<b>3178</b>	<b>94</b>	<b>375</b>	<b>16</b>



# ISAM

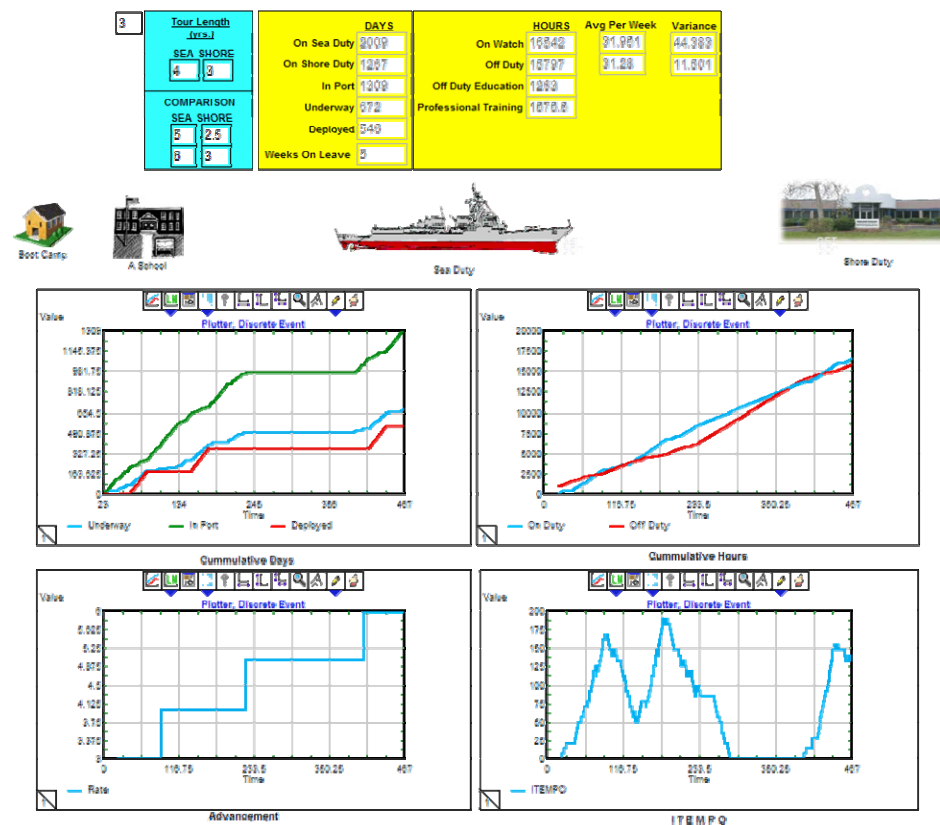


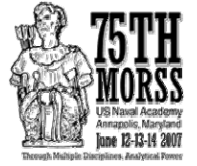
## Capabilities & Limitations:

- ✓ Very adaptable
- ✓ Quick turnaround of results
- Not a flow model – single sailor
- Dependent on 5VM content
- Dependent on business rules

## Potential Applications:

- Army deployment/assignment alternatives
- IA rotation alternatives
- Rotation of Field Operatives (FBI, CIA, etc.)
- Shift rotation (Police and Fire Departments)
- Any situation involving a rotating work force





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# Questions?

# Individual Sailor Assignment Model (ISAM)

Backups



# Metrics

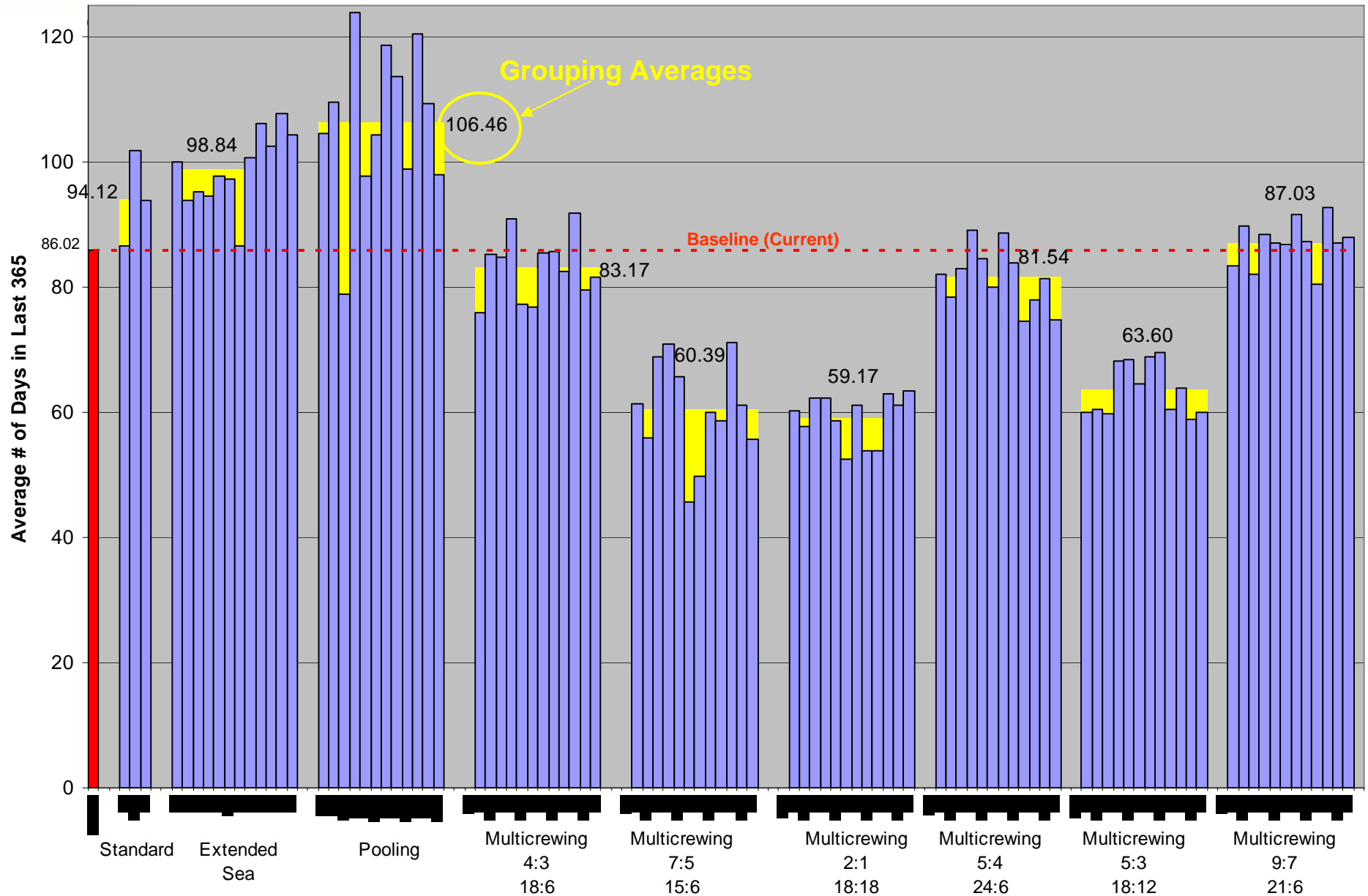
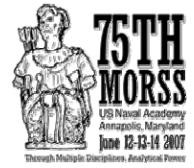


Metric	Weekly	9 years	Measure of:	CAT	Comments
Cum hrs on watch	x	x	Direct workload	OPS	Driven by ship sked and sailor assignment
Avg weekly hrs on watch	x	x	Direct workload distribution & variation	OPS	
Variance of weekly hrs on watch		x	Direct workload variation	OPS	
Cum days on SEA DUTY	x	x	OPTEMPO	TEMPO	Driven by ship sked and sailor assignment
Cum days on SHORE DUTY	x	x	PERSTEMPO	TEMPO	
SEA/SHORE DUTY ratio	x	x	OPTEMPO/PERSTEMPO	TEMPO	
Cum underway days	x	x	OPTEMPO	TEMPO	
Cum days out of homeport	x	x	ITEMPO	TEMPO	
Days out of homeport in last 365 days	x	x	ITEMPO	TEMPO	
Cum off-duty hours	x	x	Quality of Life	QOL	Driven by ship sked and sailor assignment  RULE: Holidays not observed underway RULE: No leave when ship is deployed RULE: Leave can not interfere with required training RULE: Can not go into leave hole
Avg weekly off-duty hours	x	x	Quality of Life	QOL	
Variance of weekly off-duty hours		x	Quality of Life	QOL	
Cum holidays off	x	x	Quality of Life	QOL	
Avg number of holidays off		x	Quality of Life	QOL	
Cum days of leave taken	x	x	Quality of Life	QOL	
Avg number of leave days taken		x	Quality of Life	QOL	
Variance of leave days taken		x	Quality of Life	QOL	
Cum On-duty/Off-duty ratio	x	x	Sea-centric measure	QOS	
Avg On-duty/Off-duty ratio	x	x	Sea-centric measure	QOS	
Cum training hrs avail	x	x	Career development resource	CAREER	Driven by ship sked and sailor assignment  Dependent on skill objects and how they are scheduled Somewhat subjective but will consistent schedules  RULE: Up to a max of 10hrs/week - counts against off-duty hours  RULE: Sailor makes rate at next exam cycle after all requirements are met RULE: Sailor is qualified when all rqmts are met
Avg weekly training hrs available	x	x	Career development resource	CAREER	
Variance of weekly trng hrs available		x	Career dev resource variation/risk	CAREER	
Cum training hrs required for progress	x	x	Professional/Personnel development	CAREER	
Avg weekly trng hrs rqd for progress	x	x	Professional/Personnel development	CAREER	
Cum rqd vs avail training hrs delta	x	x	Professional/Personnel development	CAREER	
Cum hrs avail for off-duty education	x	x		CAREER	
Weeks with AA degree		x		CAREER	
Weeks with BA/BS degree		x		CAREER	
Weeks with MA/MS degree		x		CAREER	
Cum weeks an E4/E5/E6	x	x	Professional/Personnel development	CAREER	
Weeks to make E4/E5/E6		x	Professional/Personnel development	CAREER	
Weeks certified/qualified		x	Professional/Personnel development	CAREER	
Cum Human Capital Index	x	x	Professional/Personnel development	CAREER	



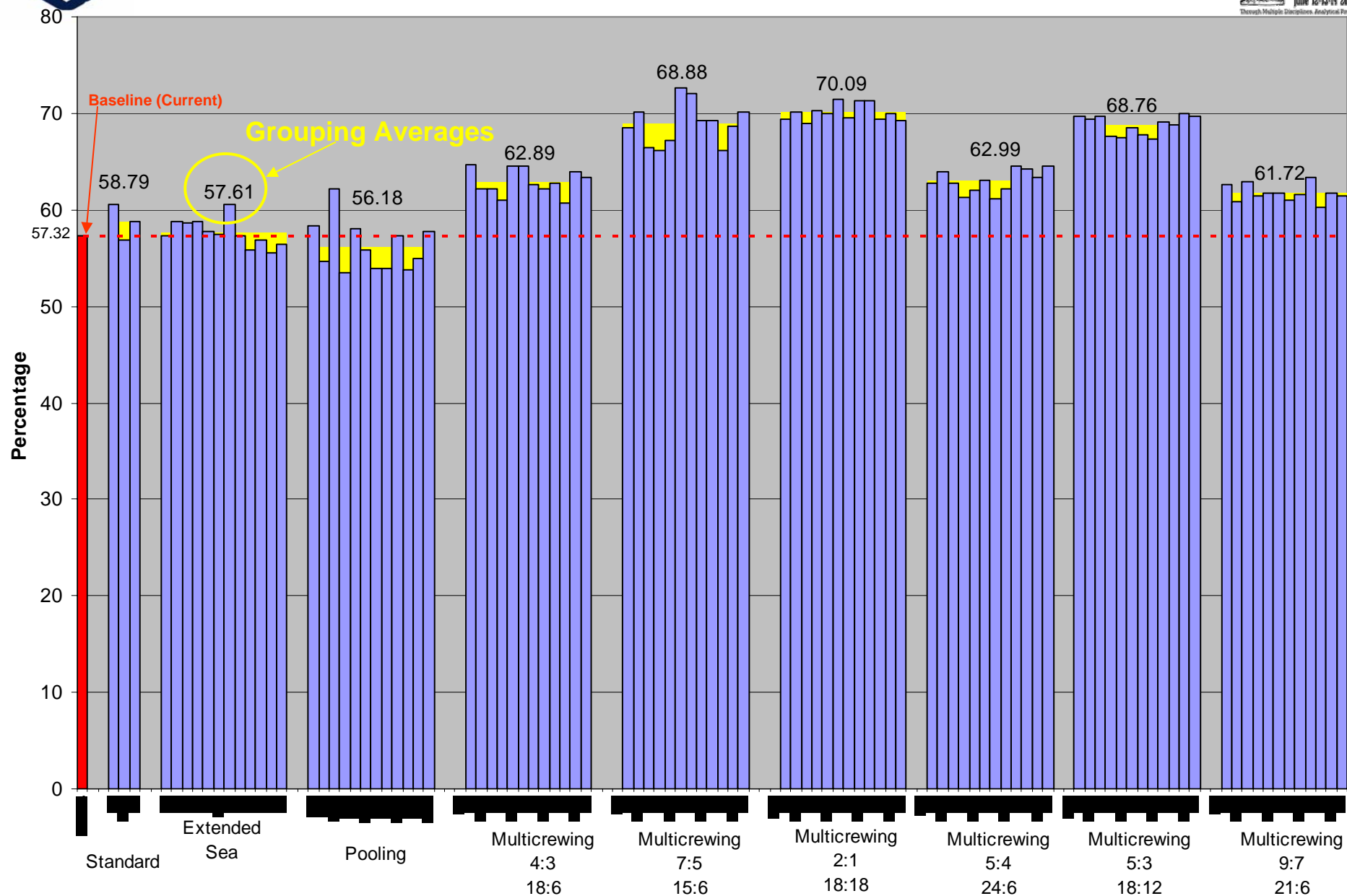


## Average ITEMPO



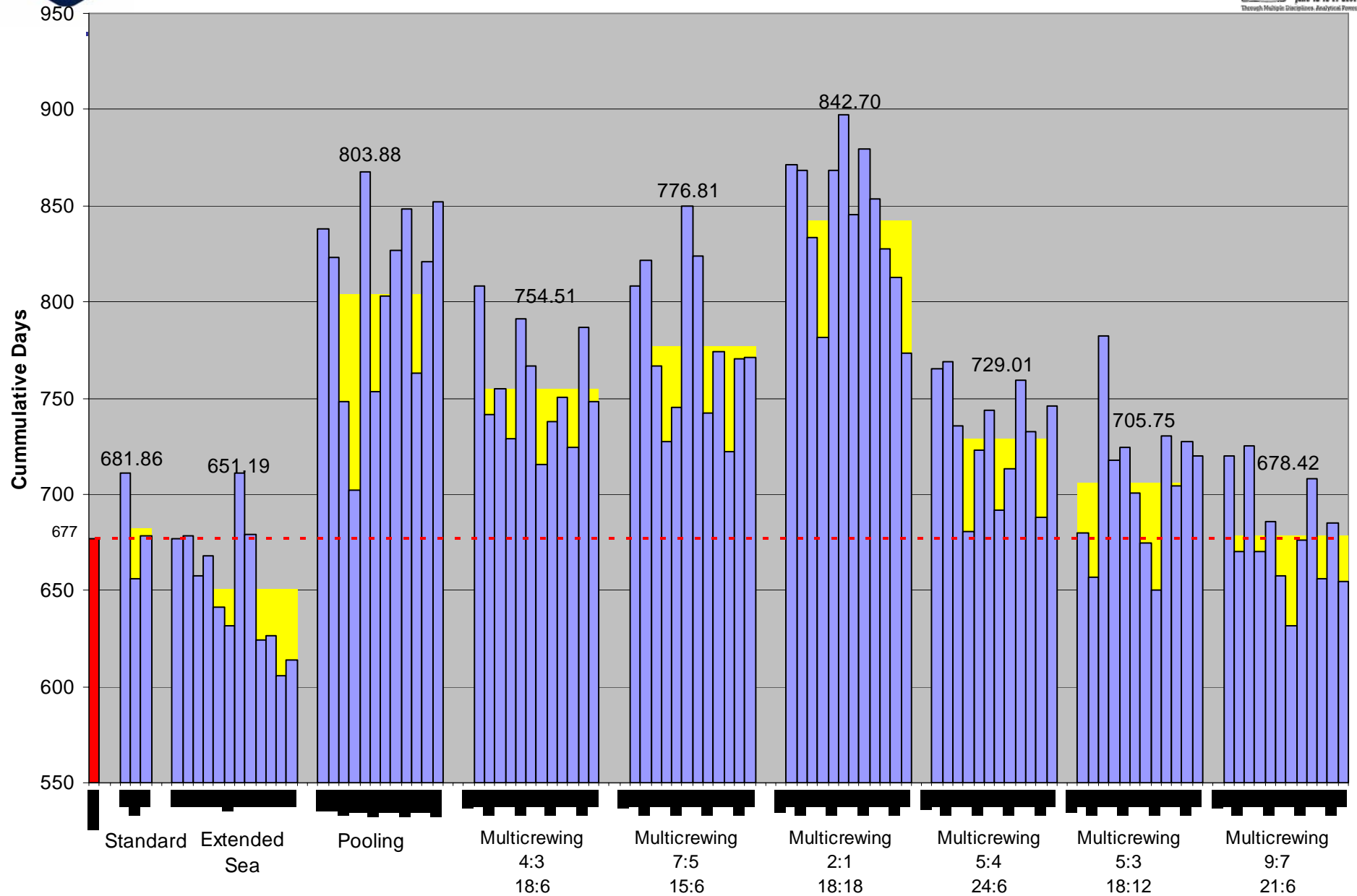
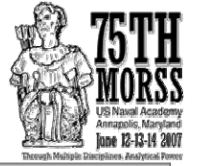


## % Time Avai To Go Home



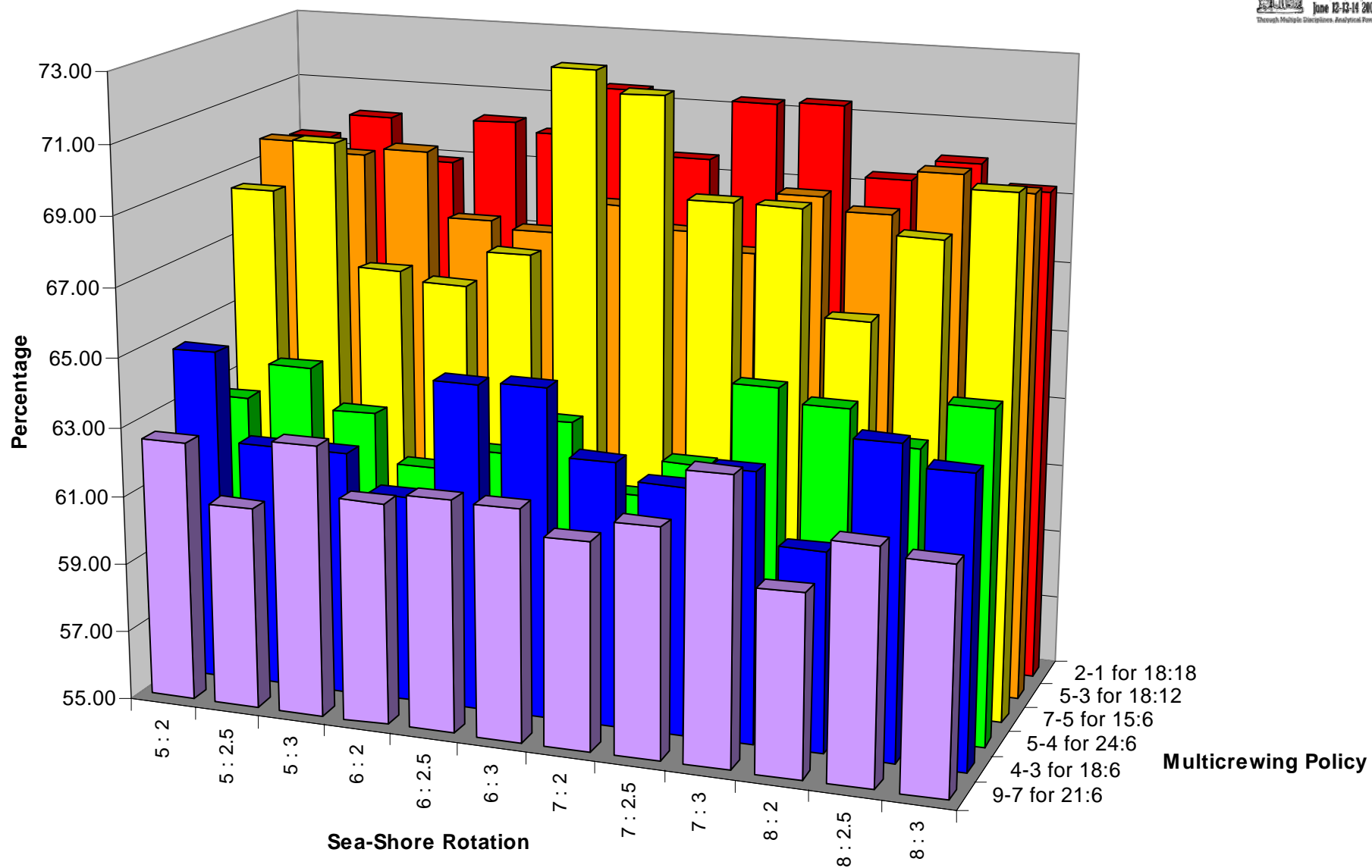


## Cumm Time Off Duty Educ



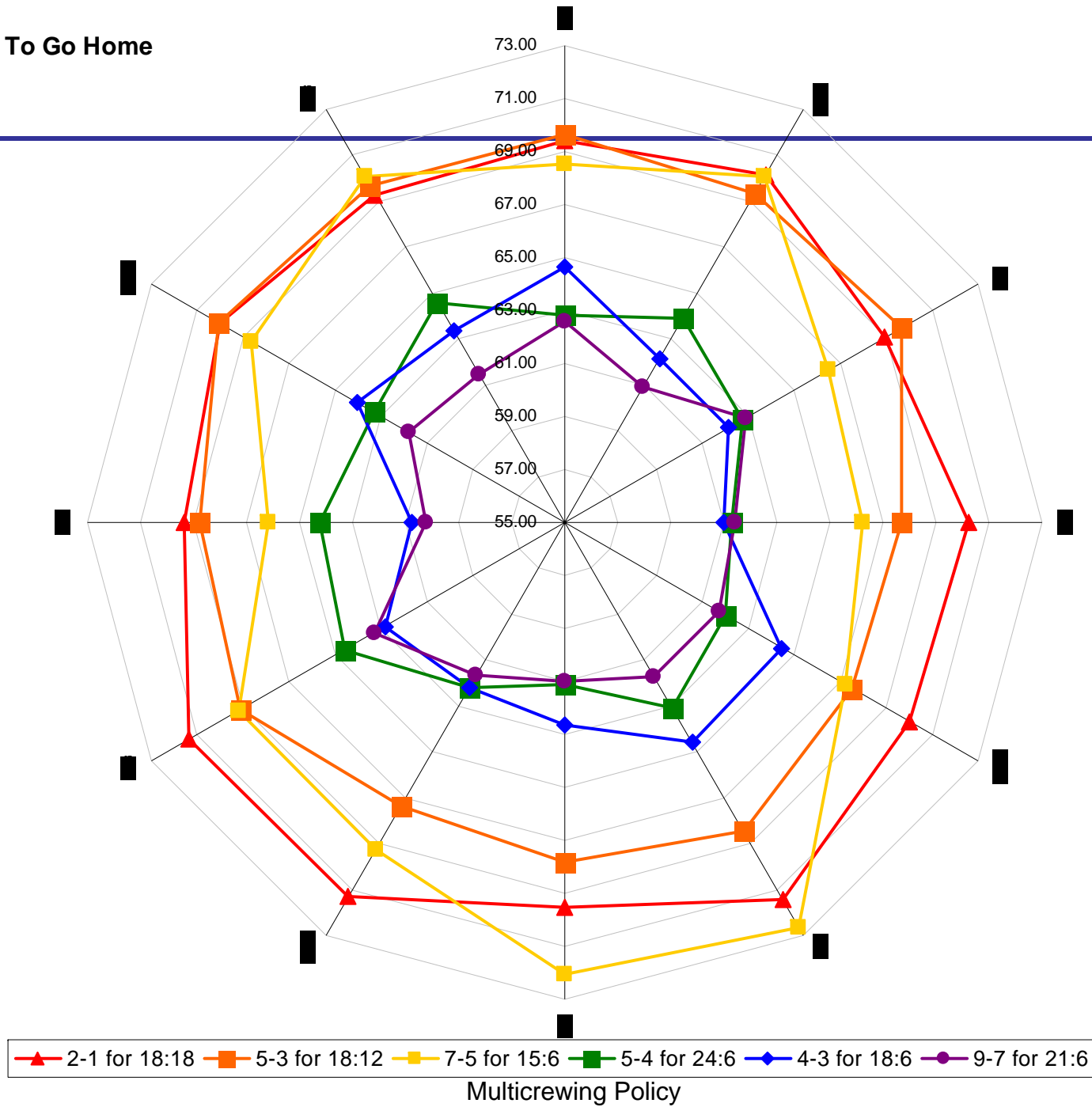
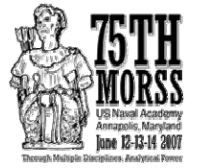


## % Time Avai To Go Home



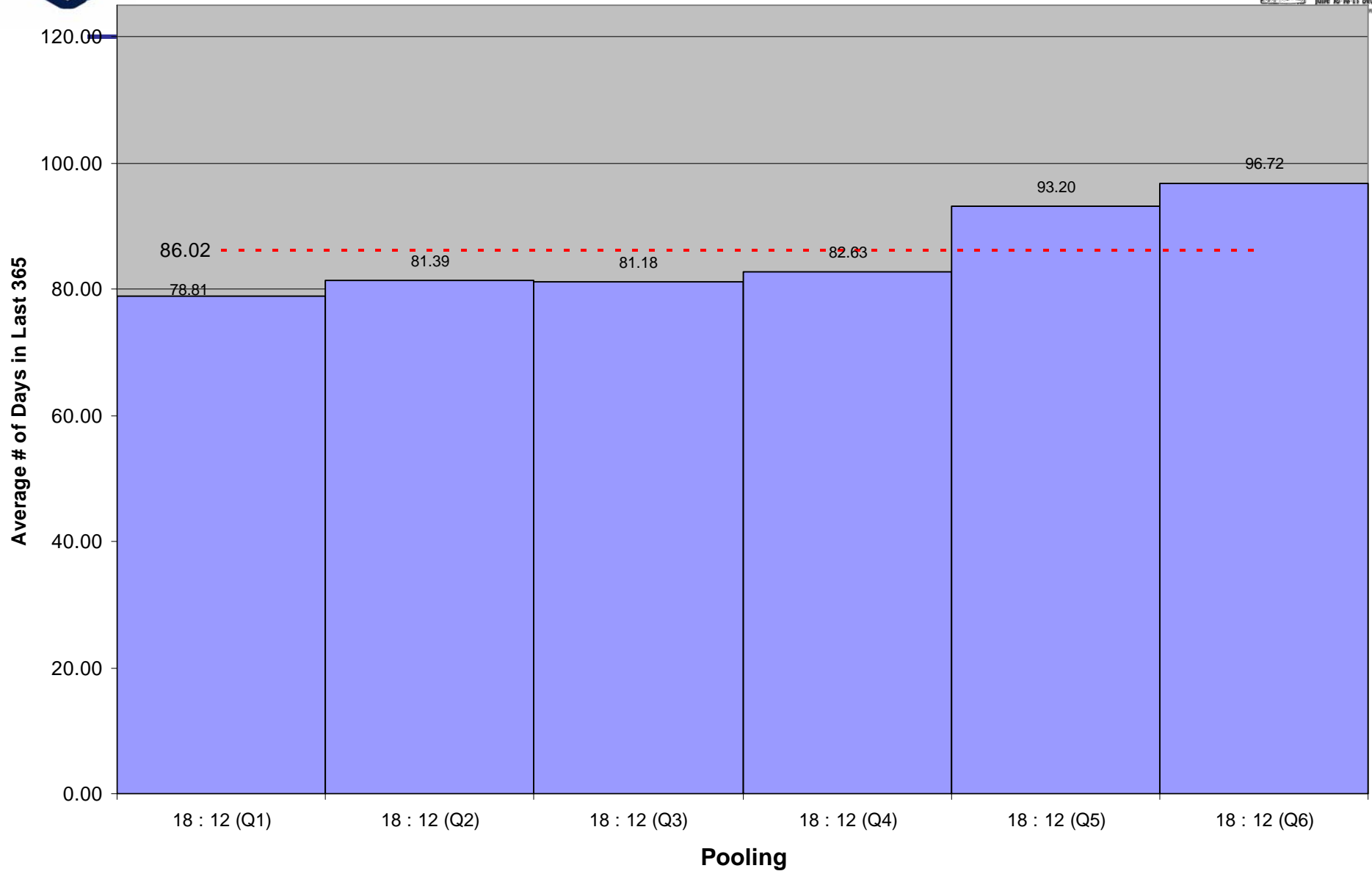


% Time Avail To Go Home





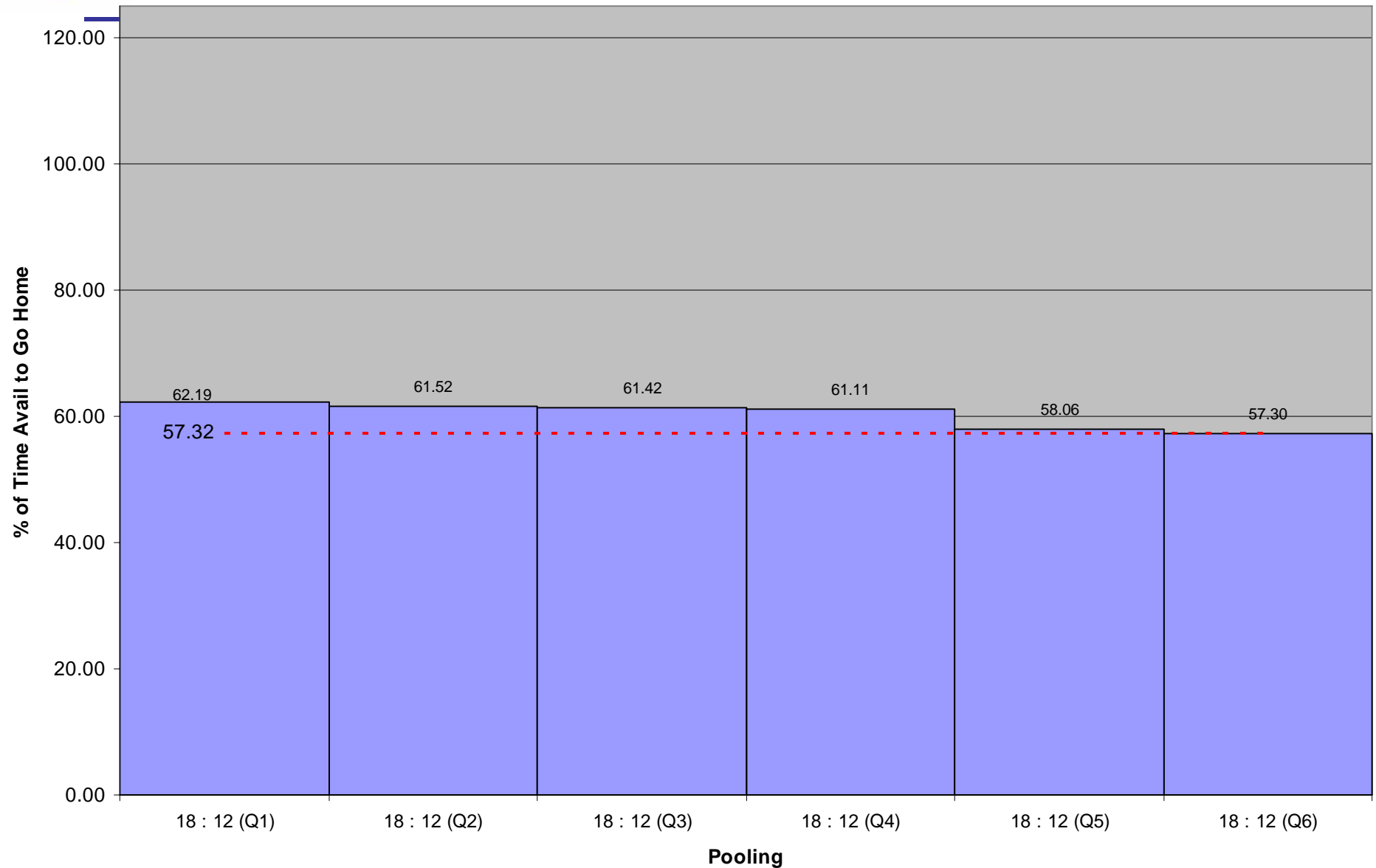
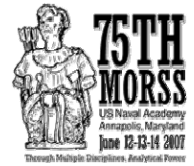
## Average ITEMPO



Comparison for personnel arriving at different times of the unit's employment cycle



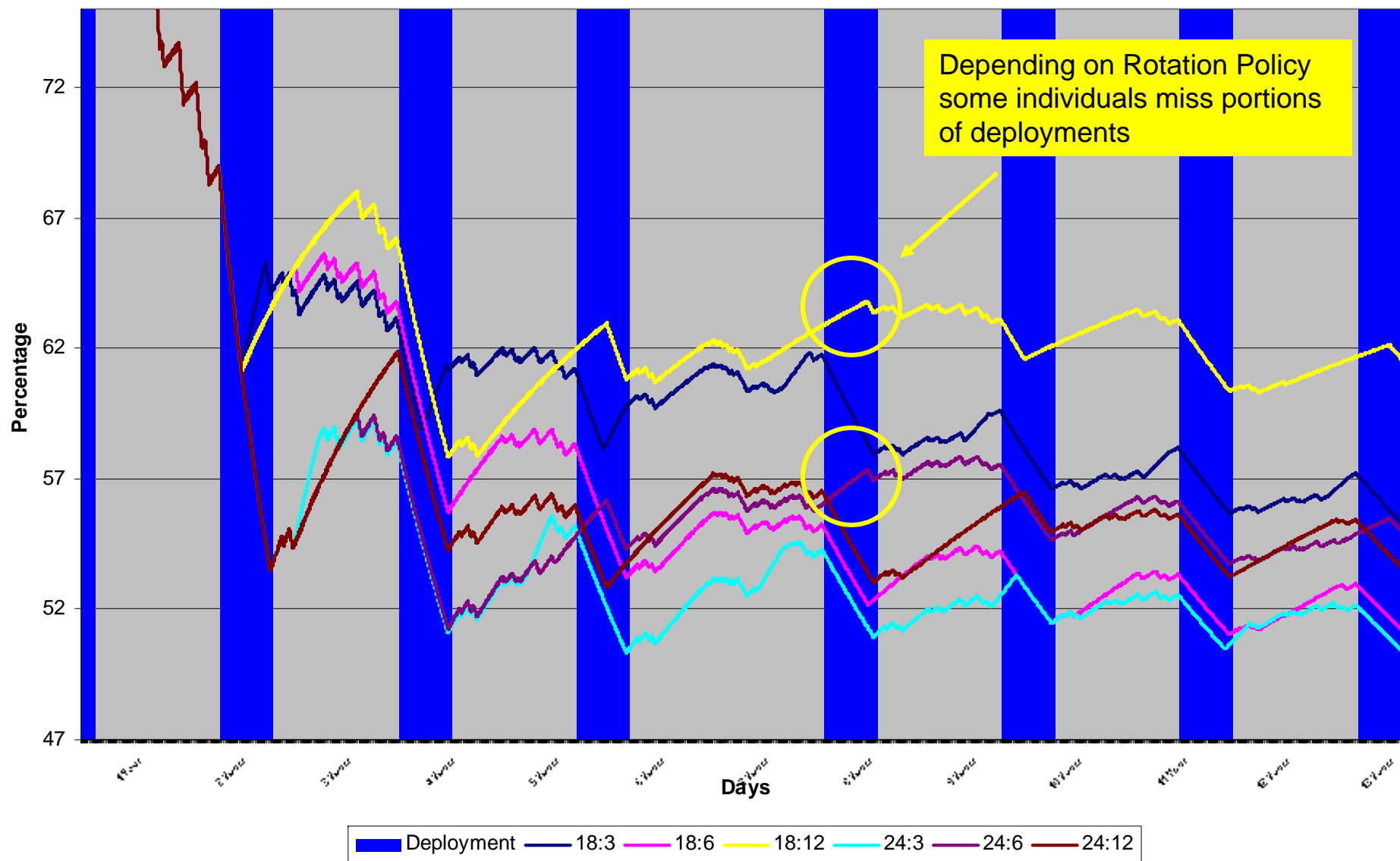
## HOME TEMPO



Comparison for personnel arriving at different times of the unit's employment cycle



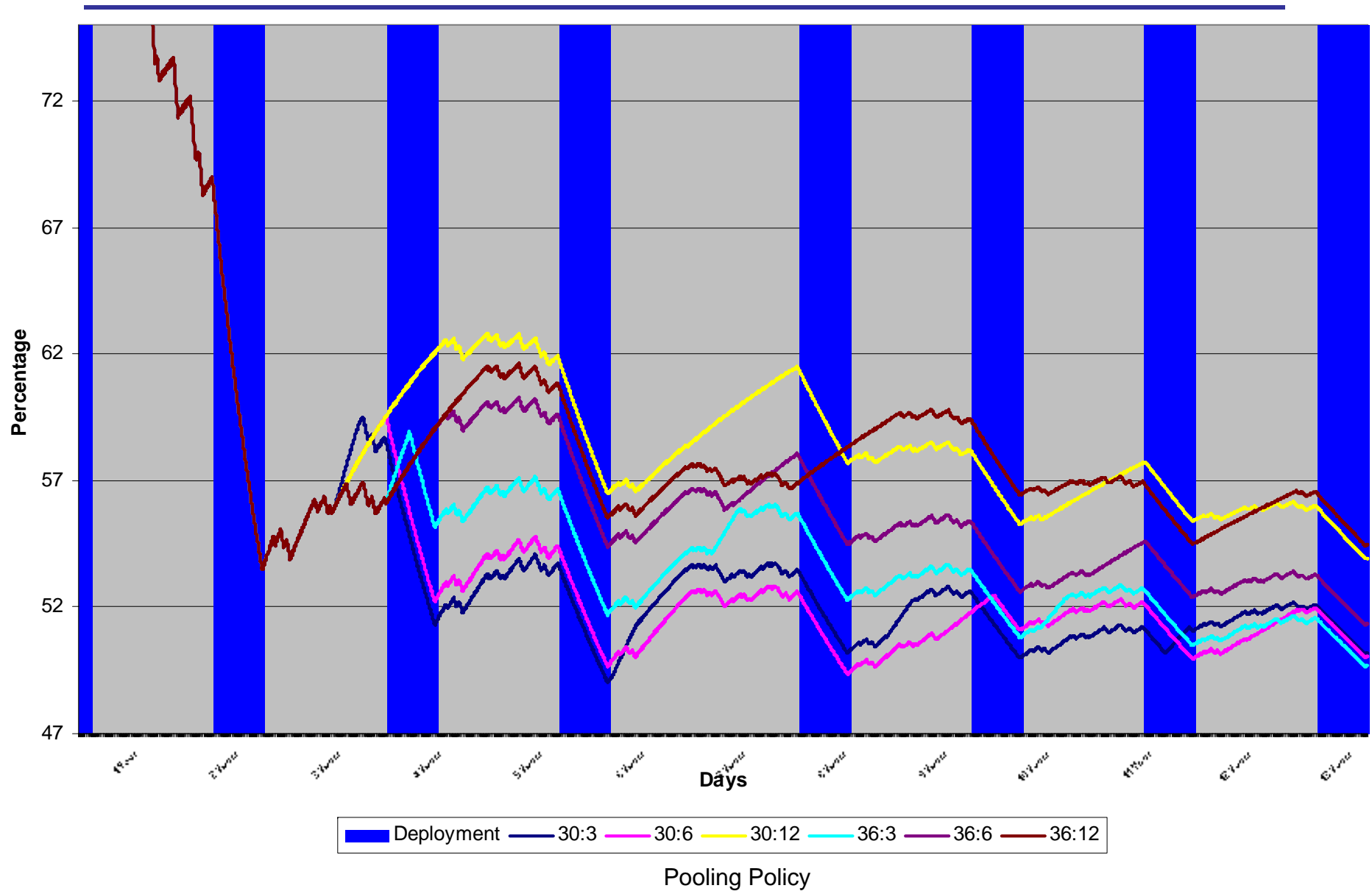
## % Time Avail To Go Home



Pooling Policy

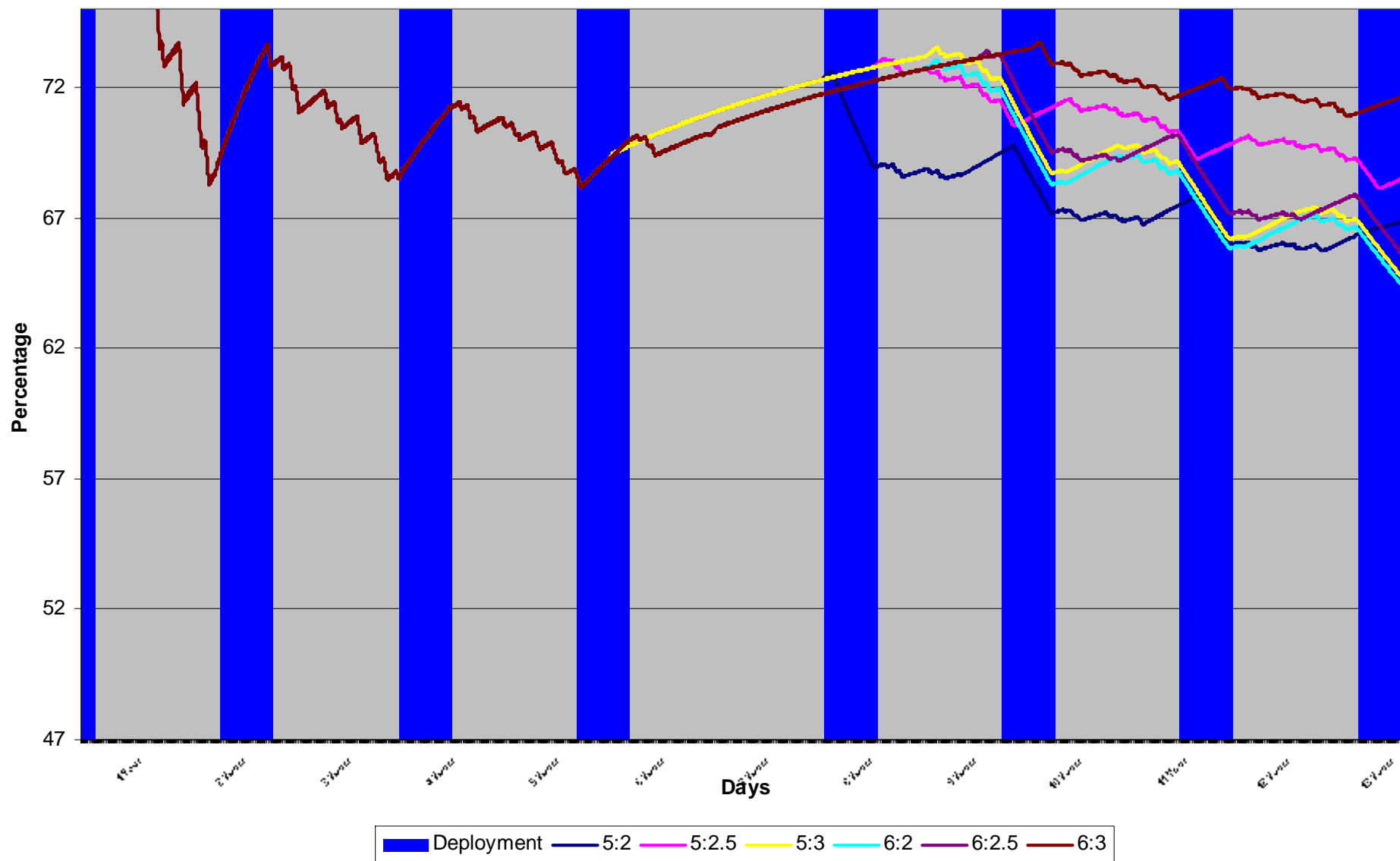


## % Time Avail To Go Home





## % Time Avail To Go Home



7-5 Multicrewing Policy